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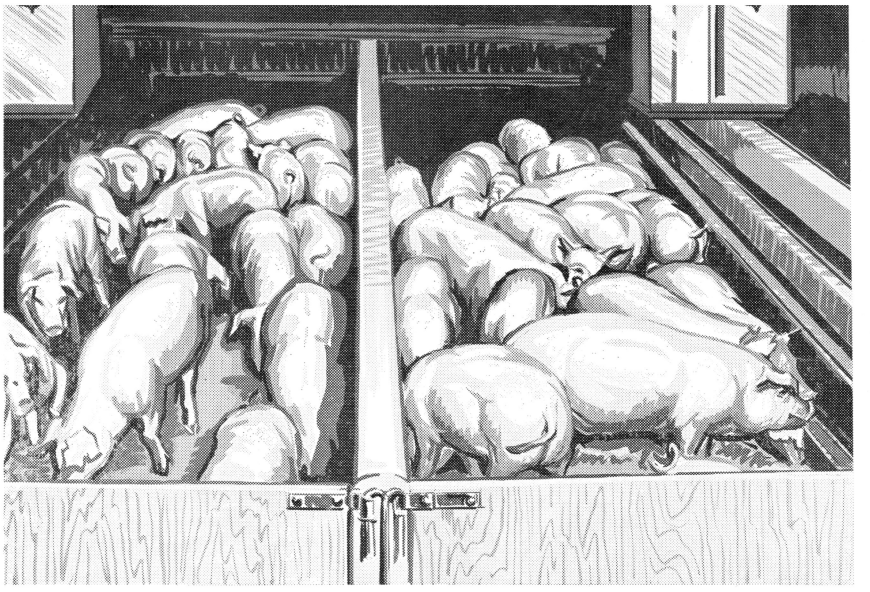

SWINE IN CONFINEMENT

The Story of a 'MODEL'

By John Wallize
with technical material supplied by
Thamon E. Hazen, Vaughn C. Speer and William P. Switzer

THIS IS THE STORY of a "model." Today it's pointed to with pride. But to get where it is today, there had to be some risks. And there were times that those who point with pride today were not very proud of it in the past.

The story of such a model is told not so that you might copy it, but so you may see how it developed and avoid the same mistakes.

Our story is of a confinement system for hogs and the search for an ideal production system. And like a young girl's dreams, the accomplishments are quite admirable, but the ideal has never been attained.

Just what is the ideal system for producing hogs in Iowa?

There could be more than 100,000 answers to that question, according to a group of Iowa State University scientists who have spent the past six years in a "trial" with hogs in confinement. They are Dr. Vaughn C. Speer, ISU animal scientist who specializes in swine nutrition and directs the research program; Dr. Thamon E. Hazen, ISU agricultural engineer whose specialties are animal facilities, environmental control, and waste disposal; Don Baker, research station manager; two veterinarians, Dr. William Switzer and Dr. Kenneth Preston, who are concerned with animal health aspects; plus a group of graduate students who bring specialties such as biochemistry or engineering to the study.

More than 108,000 farmers in the state produce hogs, the ISU experts explain. And the ideal or best production system could be different on almost every farm.

So while the ISU scientists cannot say what the best system is for you, they do have an interesting story of what has been done at the Swine Nutrition Research Station outside of Ames.

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Not Recommendations—Guidelines

The results at the Ames research farm are not recommendations, Speer and Hazen emphasize. Some of the things they have done they recommend you avoid; others you might want to try, but that depends on what you want to accomplish.

But to start at the beginning, just what is a confinement system? To people in some parts of the world, where the wild boar is the target of hunters, confinement might mean raising hogs inside a fence. But here in the Corn Belt, confinement has come to mean raising hogs from farrowing to market inside a building or on a limited concrete area with open front structures.

Basically there are two systems of swine production in Iowa, the ISU specialists explain. These are pasture and confinement production. However, with Iowa winters taking up four months of the year, most farmers have some type of confinement production at least temporarily.

Do Speer and Hazen then recommend the confinement system?

Not for everybody.

First, the confinement system is only for those in the swine business—not for the hobbyist. It also is not for the hog producer who farrows one or two litters a year. Its sizable investment requires volume production and peak use of facilities.

What does the confinement system do? Primarily, its objective is to replace hand labor with equipment. Labor is the number two cost in swine production. The confinement system mainly allows the producer to do the chores around the hog house at his convenience.

Confinement production of swine doesn't guarantee a better profit. However, with reduced labor, continuous instead of seasonal production, and gains in feed efficiency, profits *should* increase with the confinement system.

Science has made great strides in improving the nutrition and the breeding of swine. Today, however, these improvements are limited if environment is not controlled. ISU studies show temperatures encountered during normal Iowa winters increased feed requirements 70 to 80 pounds for each 100 pounds of gain. With cold temperatures, too much feed goes to maintain body heat and not for weight gain.

And the 70 to 80 pounds of extra feed under winter conditions is the average—it can be more. With feed making up two-thirds of the cost of pork production, it's no wonder men are looking to housing to control environment for more efficient production.

Confinement raising also frees pasture land for more cropping. In many areas of the state, land is too valuable to be used for pasture. At the swine research center, the land required for swine production has been reduced about 50 percent.

Confinement production of pork is for the man who wants to manage rather than to labor; it is for the man who is able to invest some money in facilities; and most important, it is for the man who has the skill to manage carefully a concentration of animals and the problems this can cause.

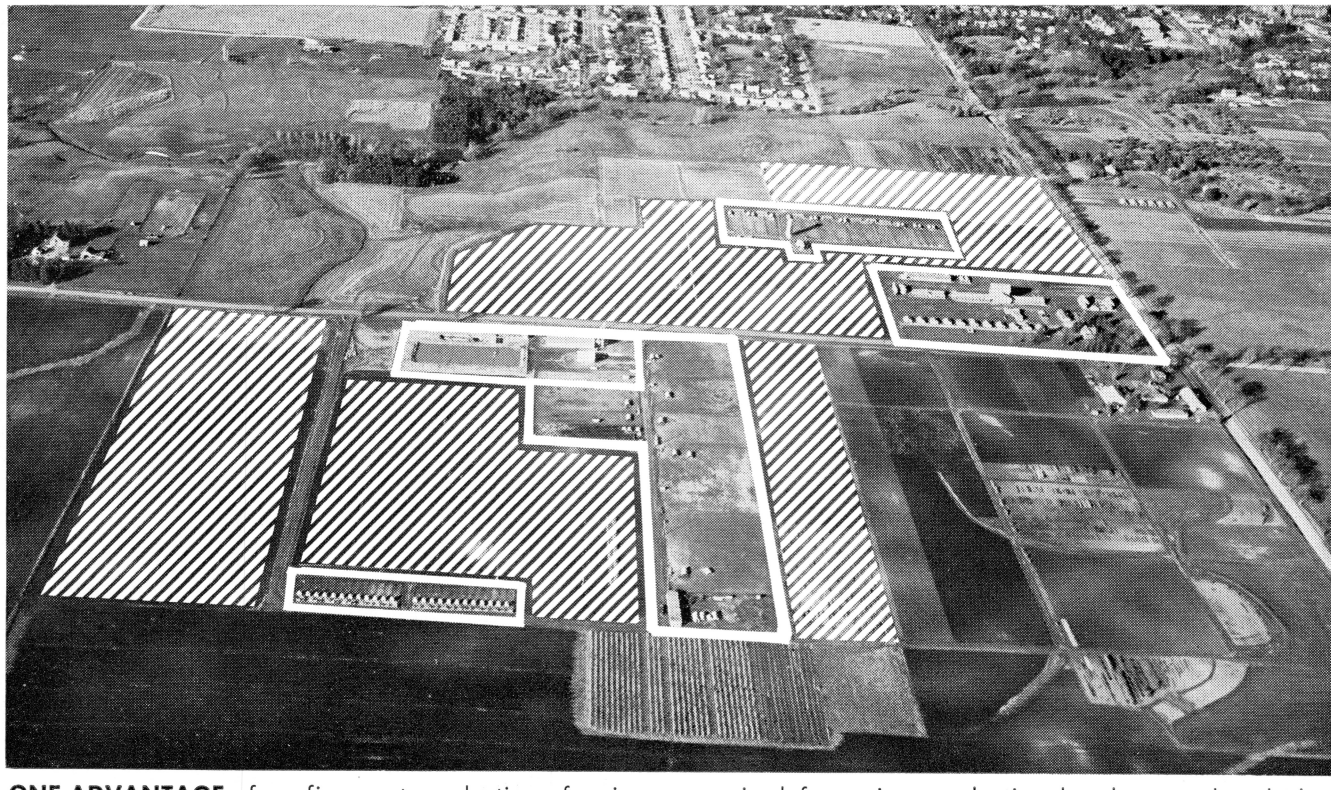
Problems Listed

The problems with confinement housing are odor, disease control, waste disposal, and a lack of exact knowledge and guidelines in many areas. And with all large-scale operations, they can also lose money rapidly. In fact, death losses in the ISU system amounted to $500 per month in its beginning stages.

Construction cost isn't really a major factor in a confinement system, according to the ISU scientists. While such a system may require what appears to be a large initial investment, the cost of facilities is quite low when depreciated over a production period of 10 years. For example, $500 for a farrowing stall is paid for by as many as 12 litters of 10 pigs each for 10 years, or 1,200 pigs.

Odor control is a lot more complex than it might appear. Odor is just the evidence that a lot of organic compounds are in gaseous form throughout the unit. In addition to the odor, these vapors corrode buildings and equipment.

At ISU, research continues to improve control of the odor and atmosphere in the confinement house. Scientists are not satisfied with the degree of control they have today.



ONE ADVANTAGE of confinement production of swine is that it frees land for crop production. In some parts of the state, land is too valuable for pasture. At Iowa State's Swine Nutrition Research Station, the land required for swine production has been reduced about 50 percent. The enclosed areas are now used for swine production, while the cross-hatched areas are former pasture now returned to crop production.

But at the same time the odor and atmosphere can be controlled well enough that farmers need not reject confinement production on this basis.

Not all the answers are available regarding disease control. Because animals are concentrated in a confinement system, disease control is of serious concern. But the ISU scientists have been surprised at the improved health status the swine nutrition herd has reached over the past 6 years.

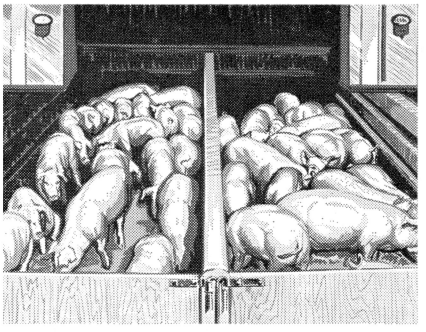
Waste disposal is likewise a serious problem. Today's concern with dirty streams and polluted air (which includes odors in many suburban areas), requires special attention to waste disposal. Again there is no miracle system that will solve all problems. But there are systems which can satisfactorily handle wastes from swine confinement houses. Proper design and management is the key.

History

Confinement housing for swine has been used in Europe for many years. Only in the past 10 years has it received much attention in this country, and the real concentration on the subject has been within the past 4 or 5 years. Today it is estimated that about 10 percent of Iowa's market hogs are produced under confinement. An Illinois survey shows 35 percent of that state's swine are raised in confinement, and 63 percent of the large-scale producers with more than 500 head per year are using a confinement system.

ISU's present confinement system began about 8 years ago as a model farrowing house and nursery which was the start of a life cycle housing project. Since then, the confinement system developed both systematically and randomly. Some of the developments came as research was needed to answer specific questions. Others were emergency answers to unexpected problems.

"Necessity brought about many things," explains Dr. Hazen. "We made mistakes, but that's part of our job. It's best that we try some of the 'impractical' things, rather than 200 or more farmers each making the same errors and risking their incomes."



SWINE IN CONFINEMENT

The System

THE CONFINEMENT system of raising hogs at Iowa State University houses pigs from birth to finished hogs. But actually, part of the production cycle does take place outside the buildings.

Pork production begins with the breeding cycle. And the breeding herd at the ISU farm is maintained in permanent lots. The next step on the farm is likely to be confinement housing of sows and boars. But for now, breeding animals are confined to a set of permanently arranged pens for convenient feeding and care.

Continual use of the same lots for the breeding animals may cause some raised eyebrows, because there is no moving and disinfecting. But the ISU scientists rely on a "closed herd" system, which has impressed even the research team with its success.

Should every pork producer use a closed herd in a confinement program? "Well, not quite," says Dr. Vaughn C. Speer, ISU swine nutritionist who directs operations at the swine research facility. "But every pork producer ought to consider it."

Essentially, Speer recognizes that one system isn't going to be suited to everyone. But with the success of the ISU closed herd system, the pork producer needs a pretty good reason for not using such a system.

The closed herd essentially means that all pigs are produced on the farm. There are no feeder pigs or replacement pigs introduced to the system.

The only way to use purchased feeder pigs with our present knowledge of the confinement system is to move the pigs through in groups, allowing the unit to go vacant after each group and thoroughly disinfecting the buildings and equipment.

Speer and his associates are building disease resistance with the "closed herd." Under this system, animals build resistance to the disease organisms in the environment through natural body defense mechanisms and selection. As long as no new animals are introduced which may not have the same resistance—or even worse, which could introduce new disease organisms to the herd—the system works satisfactorily.

The "closed herd" system is similar to the situation Americans find themselves in when traveling to foreign lands. Water or food may cause illness for the visiting American, but the natives consume the same items with no ill effect. The native, like the closed swine herd, has built up resistance to the ordi-